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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,302	09/16/2003	Takehiro Yamaoka	S004-5124	2609

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ADAMS & WILKS
31st Floor
50 Broadway
New York, NY 10004

EXAMINER

LARKIN, DANIEL SEAN

ART UNIT	PAPER NUMBER
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2856

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/663,302

Applicant(s)

YAMAOKA ET AL.

Examiner

Daniel S. Larkin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 6-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicants' election of the species of Figure 1, claims 1-5, in the reply filed on 23 September 2004 is acknowledged. Because applicants did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 6-12 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 23 September 2004.

Priority

3. Acknowledgment is made of applicants' claim for foreign priority based on applications filed in Japan on 17 September 2002 and 22 April 2003. It is noted, however, that applicants have not filed certified copies of the Japanese applications as required by 35 U.S.C. 119(b).

Drawings

4. Figure 14 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

Reference numeral "13", as shown in Figure 11, does not appear within the written specification.

6. Corrected drawing sheets, or amendment to the specification to add the reference character(s) in the description, are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicants will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

7. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicants' cooperation is requested in correcting any errors of which applicants may become aware in the specification.

8. The disclosure is objected to because of the following informalities:

Page 2, line 2: A -- comma -- should be inserted prior to the abbreviation "etc.".

Page 2, line 6: A -- comma -- should be inserted after both occurrences of the term "forces".

Page 2, line 24: The numeral "11" should be corrected to read -- 12 --.

Page 15, line 23: A -- comma -- should be inserted prior to the abbreviation "etc.".

Page 16, line 1 and 21: A -- comma -- should be inserted prior to the abbreviation "etc.".

Page 17, line 10: The article "the" should be corrected to read -- then --.

Page 21, lines 9 and 24: The term "pattern" should be corrected to read -- patterns --.

Page 28, line 20: The first occurrence of the term "to" should be deleted.

Page 29, lines 7 and 13: The specification fails to provide guidance as to what type of Q-value would be deemed a "low Q-value".

Page 29, line 15: The specification fails to provide guidance as to what type of Q-value would be deemed a "high Q-value".

Page 33, line 1: Reference numeral -- 13 -- should be inserted after the second occurrence of the term "filter".

Page 33, line 2: Reference numeral -- 3 -- should be inserted after the term "means". Appropriate correction is required.

Claim Objections

9. Claim 4 is objected to because of the following informalities:

Re claim 4, claim line 1: The phrase "The scanning probe microscope operation method" lacks antecedent basis. Appropriate correction is required.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 2-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 2, claim lines 4-6: The claim language is unclear as to when the relationship " $G=G_o$ "; and the claim language is not written clearly to understand each of the terms of the relationship " $G= (A/A_o) \times G_o$ " and what the relationship means.

Re claim 3, claim line 4: The claim language is unclear as to what the symbol "L" represents.

Re claim 4, claim lines 8 and 9: One is unclear as to how much separation of the sample from the probe is achieved through movement of a "microscopic distance".

Re claim 5, claim lines 4 and 7: The language of the claim is unclear as to what other "Q-control parameters" are encompassed by the abbreviation "etc.". Additionally, are the contents within the parentheses presented as claim limitations or merely as examples?

Re claim 5, claim lines 4: It is unclear from the claim language what the symbol "G" represents.

Re claim 5, claim line 11: The claim language is unclear as to what type of value would be considered a "high Q-value".

Re claim 5, claim line 13: The language of the claim is unclear as to what type of value would be considered a "low Q-value".

Re claim 5, claim line 15: The claim language is unclear as to what type of value would be considered a "high Q-value". Moreover, is this "high Q-value" the same high Q-value as recited above in claim line 11?

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipate by US 6,189,374 (Adderton et al.).

With respect to the limitations of claim 1, the reference to Adderton et al. discloses an AFM having an active damping circuit for modifying the quality factor ("Q") of the cantilever response, as shown in Figures 3 and 4, comprising extraction means/phase shifter (64) for extracting speed from a vibration detection signal of a cantilever (20); a variable amplifier/gain stage (65) is utilized to adjust the gain of the

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signal from the phase shifter (64); a adder/summer amplifier (68) for superimposing an output of the gain stage (65) with an output signal of an oscillator (66) normally occurring in a dynamically driven method for forcing a cantilever (20) to be oscillated by piezoelectric means (36), wherein the gain of the signal is adjusted to control Q for an optimum value with respect to the environment, col. 11, lines 9-18.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

The prior art to US 6,038,916 (Cleveland et al.) discloses a method and apparatus for measuring energy dissipation by a probe during operation of an atomic force microscope whereby a phase detector (20) and a RMS detector (22) are utilize to process deflection signals from a cantilever (8). These processed signals are fed to the AFM control/computer (14) for further processing. The AFM control (14) provides a control signal to an AC signal source (12) which provides a driving signal to a probe oscillator (6) mounted to the cantilever (8). The reference further discloses that the Q factor of the cantilever is measured.

The prior art to US 6,005,246 (Kitamura et al.) discloses a scanning probe microscope comprising a preamplifier (8) and a phase adjuster (19) to process deflection signals from a cantilever (1). These processed signals are combined with signals from an oscillator (16) in an accumulator (18) for feeding back to the cantilever (1), as shown in Figure 1.

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15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel S. Larkin whose telephone number is 571-272-2198. The examiner can normally be reached on 8:00 AM - 5:00 PM Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel Larkin
AU 2856
07 December 2004



DANIEL S. LARKIN
PRIMARY EXAMINER